Environmental Indicators & Results-Based Management: The New Jersey Experience

Leslie McGeorge, Assistant Commissioner
Environmental Planning & Science
& NEPPS Co-chair
NJ Department of Environmental Protection
Lmcgeorge@dep.state.nj.us
609-292-1254
www.state.nj.us/dep/dsr/nepps.htm

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NJ Department of Environmental Protection

- **Pollution control & natural resource agency**
- **Functional vs. media-based organization (e.g., Environmental Planning & Science)**
- **3400 employees**

OVERVIEW

I. Guide to Environmental Results Management System (ERMS)

II. NJ's Environmental Results Management System

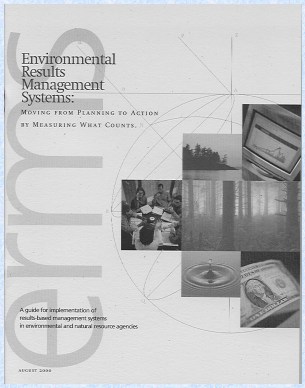
III. NEPPS

IV. Environmental Indicators

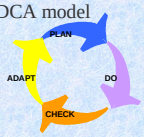
V. Water Goal & Sample Indicators

VI. Performance Measure Challenges

I. Environmental Results Management Systems (ERMS)



- State guide to environmental results management systems
- Follows PDCA model
  - Plan
  - Do
  - Check
  - Adapt



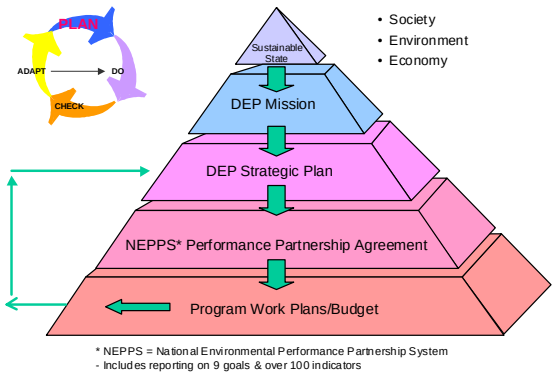
- ERMS increases use of environmental information in making decisions
- NJ system follows key points in guide

- **States contributing to ERMS Guide: MN, NH, NJ, OR, PA, VT, WI**
- **Other states active in use of environmental indicators include: DE, FL, IL, WA, New England states/EPA Region 1**

Major Points in ERMS Guide

✔**Plan**	**Planning System with measurable objectives**
Check	**Structured measurement system(indicators) connected to planning system**
Adapt	**Management adaptation process based on measurement results**

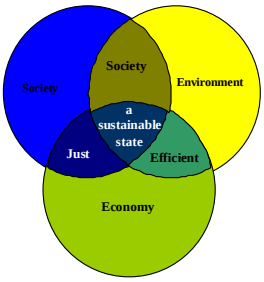
II. NJ's RESULTS-BASED MANAGEMENT SYSTEM



* NEPPS = National Environmental Performance Partnership System
- Includes reporting on 9 goals & over 100 indicators

Sustainable State

- 11 goals (e.g, Economic Vitality, Equity, Housing, Healthy People, Minimal Pollution & Waste)
- 41 indicators

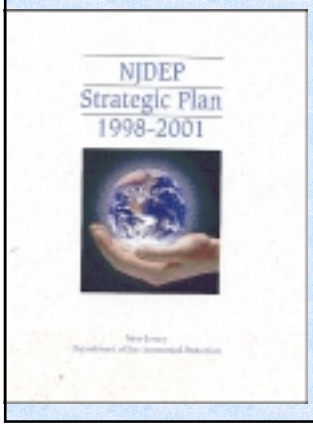


Source: NJ Future

Sustainable State Report - *Living with the Future in Mind:*

Goals & Indicators for NJ's Quality of Life

- **Second edition scheduled for release - 1/2001**
- **Coordinated by NJDEP with all state agencies & NJ Future (NGO)**



Strategic GOALS:

- Clean Air
- Clean & Plentiful Water
- Safe & Healthy Communities
- Healthy Ecosystems
- Abundant Open Space
- Open & Effective Government

NEPPS PPA

- **Goals**
- **Indicators**
- **Strategies**

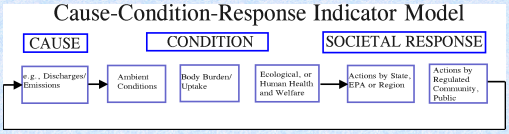
Major Points in ERMS Guide

Plan	**• Planning System with measurable objectives**
✔Check	**• Structured measurement system(indicators) connected to planning system**
Adapt	**• Management adaptation process based on measurement results**

NJ Indicators Model

(Pressure-State-Response)

Cause-Condition-Response Indicator Model

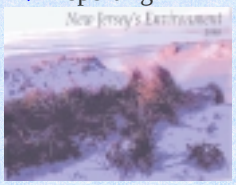


Major Points in ERMS Guide

Plan	• Planning System with measurable objectives
Check	• Structured measurement system (indicators) connected to planning system
✔Adapt	• Management adaptation process based on measurement results

NJ's Results-Based Management System: Adapation & Reporting

- Goal Owners - upper management
- Annual Environmental Progress Briefings
- Reporting -



Quarterly Strategic Reports (internal)

Annual Performance Reports (EPA, Legislature, OMB)

Technical Indicators Report

State of the Environment Report

NJDEP Environmental Progress Briefing Structure

Strategic Goals	PPA* Goals	Goal Owner
Clean Air	Global Climate Change Air Quality, Radiation	Assistant Commissioner Hart
Clean and Plentiful Water	Surface, Ground, Drinking, Water Supply	Assistant Commissioner McGeorge
Healthy Ecosystems	Land and Natural Resources	Assistant Commissioner Cantor
Safe and Healthy Communities	Site Remediation Solid/Hazardous Waste, Pesticides, Mercury	Assistant Commissioner Tormey and Boyle
Abundant Open Space	Land and Natural Resources	Assistant Commissioner Wild
Open and Effective Government	Open and Effective Government	Assistant Commissioner Tuminski

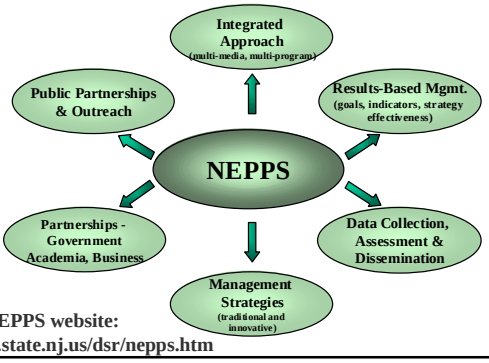
*PPA - NEPPS Performance Partnership Agreement

NJ Environmental Progress Briefings: Adaptive Management Process

- •Subgoals
- •Milestones
- •Environmental Status (Environmental Indicators)
- •Analysis of Progress Toward Goals
- •Causes of Environmental Conditions
- •Current Strategies
- •Focus Areas to Achieve Goals

III. National Environmental Performance Partnership System (NEPPS)

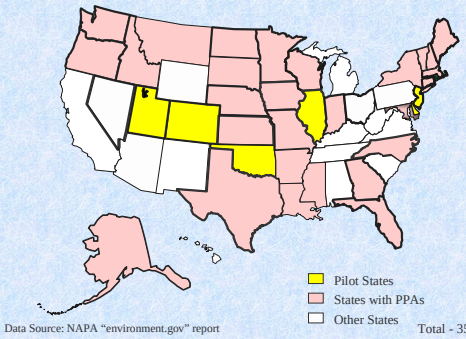
U.S. Environmental Protection Agency and States - 1995



NJ NEPPS website:
www.state.nj.us/dsr/nepps.htm

States with Performance Partnership Agreements

November 2000

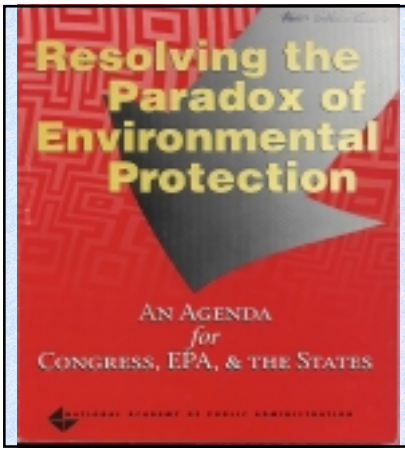


Data Source: NAPA "environment.gov" report

Total - 35 States

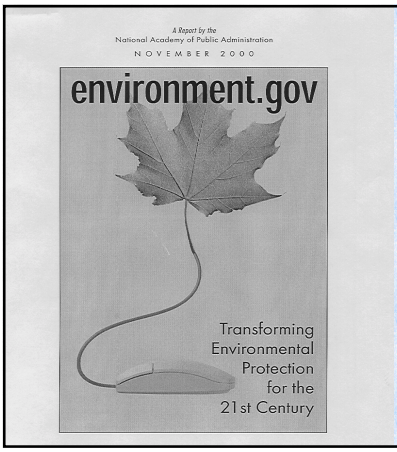
ERMS Guide

- NEPPS was key trigger for many states to initiate results-based management (RBM)
- In NJ - Commissioner Shinn played leading role in development of national NEPPS Agreement & RBM concept
- Active leadership critical for effective implementation of RBM in state agency



1997 NAPA Report: NJ - NEPPS Case Study

"NJ has gone farther than many states in implementing RBM…state is illustrative of what this system was intended to be"



2000 NAPA Report

NEPPS evaluation - 16 states

"NEPPS encourages states to gather better environmental data & set priorities"

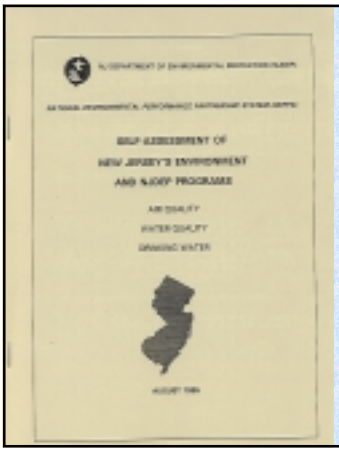
Scope of New Jersey NEPPS Program

Pilot (1995-1996)

Current (1997-1998)

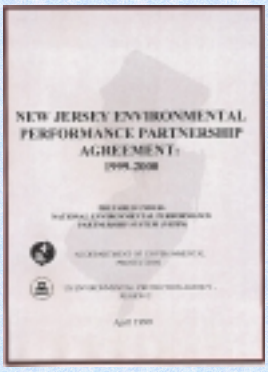
Proposed (1999-2000)

- Air
- Freshwater
- Drinking Water
- Pollution Prevention
- Mercury
- Compliance/Enforcement
- Marine Water
- Ground Water
- Solid/Hazardous Waste
- Site Remediation
- Pesticides
- Radiation (partial components)
- Land & Natural Resources
- Global Climate Change
- Sustainability
- Radiation (additional components)
- Water Supply
- Environmental Equity
- Open & Effective Government



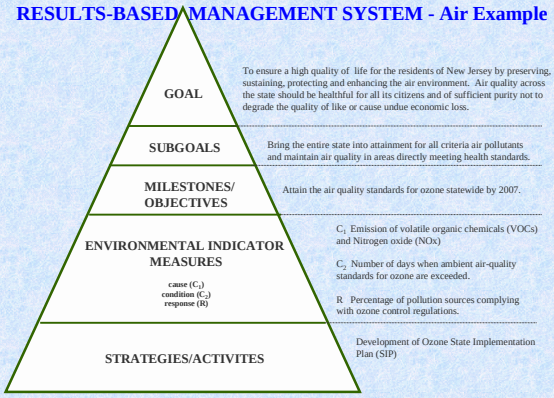
Self-Assessment Document

Identification of key environmental issues ➜ subgoals in PPA



- **Goals**
- **Indicators**
- **Strategies**

RESULTS-BASED MANAGEMENT SYSTEM - Air Example



MILESTONE CRITERIA

- **Reasonably ambitious, achievable targets**
- **Predict future conditions & trends based on knowledge of causes**
- **Baseline information (current conditions)**
- **Strategies for achievement are known, planned &/or being implemented**
- **Stakeholder involvement in development**

NEPPS AGREEMENT – AIR QUALITY GOALS/INDICATORS EXCERPT

SUBGOAL: Attainment of criteria air pollutants standards

Milestone	Cause Indicator	Condition Indicator	Response Indicator
By 2007, attain 1-hr. & 8-hr. ozone standard statewide	VEHICLE MILES TRAVELED (Data Avail.)	AMBIENT OZONE LEVELS - # OF EXCEEDANCES (Data Avail.) **Emergency room admissions & mortality data for respiratory illness** (Limited Data)	ENERGY USE REDUCTION FROM CONSERVATION PROJECTS (Data Avail.)

STRATEGIES

NEPPS Agreement

Activity Commitment Tables

- **Data Collection/Assessment**
- **Strategic Planning**
- **Strategy Implementation**
- **Strategy Evaluation**

Cross-Program NEPPS Steering Committee

Deputy Commissioner's Office
Len Colner

Environmental Planning & Science
Leslie McGeorge, Co-chair
Alena Baldwin-Brown
Branden Johnson
Marjorie Kaplan
Judy Louis
Charlie Pietarinen
Mike Serfes
Athena Sarafides
Marty Rosen
Liz Rosenblatt
Dave Rosenblatt
Karen Schaffer

NEPPS Steering Committee - cont

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Marc Ferko
Fred Bowers
Mike DiGiore
Joann Held
Debbie Hammond
Jill Lipoti/Pat Gardner
Anthony Fontana/Ron Wienkowski

Land Use Management
Sandy Krietzman
Fred Sickels

Natural Resources
Ernie Hahn

Site Remediation
Janine MacGregor/Tessie Fields

Compliance & Enforcement
Debbie Pinto
Roy Meyer

EPA Region 2
Joe Bergstein
Dennis Santella
Anthony Kahaly

Advantages to NEPPS Participation

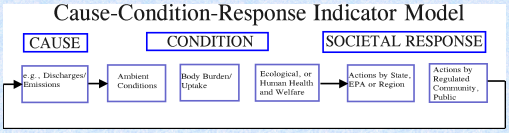
- Trigger & key to sustaining RBM in NJDEP
- Cross program, multi-media management approach
- Enhanced data collection & environmental information base
- Foundation for improved partnerships in environmental management
- Some increased flexibility with EPA, including use of federal grant funds

IV. ENVIRONMENTAL INDICATORS

- Direct or indirect measures of environmental quality used to assess status and trends of environmental conditions or effects.
- Indicators should be part of a continually improving management system

NJ Indicators Model

(Pressure-State-Response)

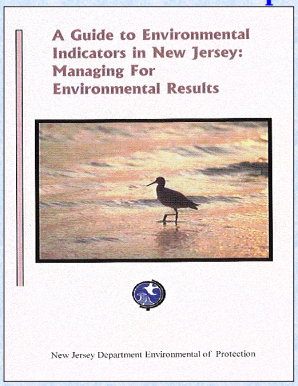


Other Indicator Models:
- Outcome-Output
- Environmental Measures - Behavioral Changes - Agency Activities

INDICATOR CRITERIA

- Related to key environmental issue
- Based on readily available, technically sound data
- Collected regularly with wide spatial distribution
- Sensitive to changes
- Linked to causes
- Linked to strategy implementation
- Education/communication tools

Indicator Development & Training



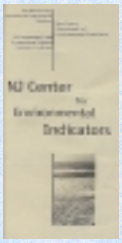
- Training for all managers
- Guide available on internet
- Additional staff training needed
- DEP - Environmental Indicators Scientist

Academic Support for Indicators

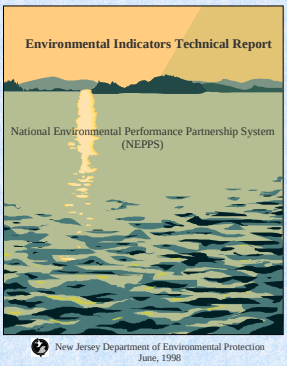
•NJ Center for Environmental Indicators (DEP/Rutgers/EOHSI partnership

•Development of environmental indicators

• Indicators research projects



Environmental Indicator Reporting



• Indicators Technical Report - 1998

• 2nd edition scheduled for publication in 2001

State of the Environment Report

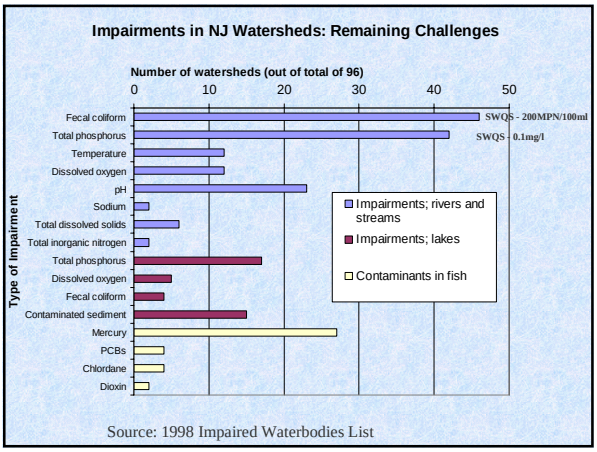
V. Example: Clean and Plentiful *Water* Goal

New Jersey's rivers, lakes, and coastal waters will be *fishable, swimmable* and support healthy ecosystems. Surface and ground waters will be *clean sources* of water. Every person in New Jersey will have *safe drinking* water. *Adequate quantities* of surface and ground water will be available for all needed uses.

Components: surface water
ground water
drinking water
water supply

A. Surface Water Subgoals

1. Protect and enhance *aquatic life*
2. Protect *recreational uses* in tidal and non tidal waters
3. Protect *fish and shellfish consumption*
4. Protect *surface water* supplies

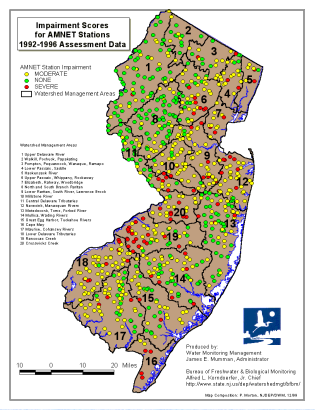


Source: 1998 Impaired Waterbodies List

Subgoal: Protect and enhance aquatic life.

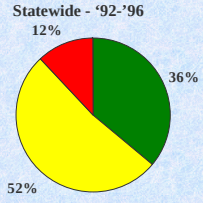
Milestone: By 2005, 50% of assessed stream miles will meet aquatic life designated uses.

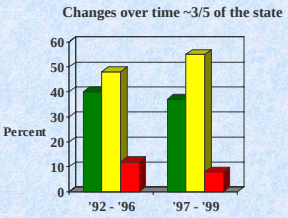
Condition Indicator: 35% meet milestone using benthic invertebrates



Subgoal - Protect and *enhance aquatic* life

Status & trends of benthic macroinvertebrates in assessed waters (condition indicator)

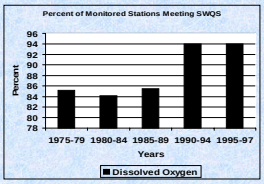


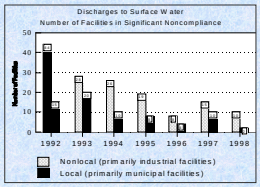


- Unimpaired
- Impaired
- Severely Impaired

Milestone = 50% unimpaired

Potential Causes/Sources of Benthic Impairment





Other Potential Causes:

Sediment quality — Other water contaminants

Flow Alteration — Habitat degradation

Land use/Land cover changes

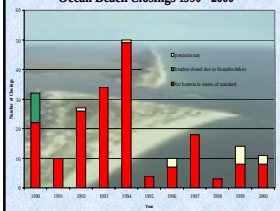
Aquatic Life: Response Indicators and Focus Areas

- Develop comprehensive biological indicators (fish, benthics, algae)
- Implement Watershed Management
- Action plan & field assessment of impaired sites
- Data assessments linking causes & impacts
- Nonpoint Source Management Grants to identify and mitigate site specific causes

Recreational Designated Uses

Milestone: By 2005, 100% of NJ beaches will be swimmable

Cooperative Coastal Monitoring Program
Ocean Beach Closings 1990 - 2000



- Closed due to bacteria
- Closed due to floatables
- Precautionary closings

Successes due to:

- Ocean dumping of sludge ended 1991
- WWTP upgrades, regional-ization, compliance
- Clean Shores Program beach/ shoreline clean-ups

Focus Areas:

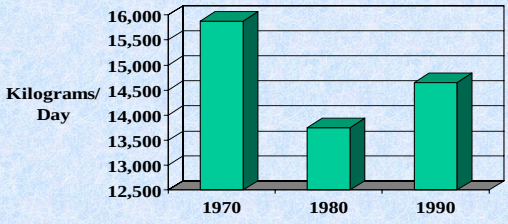
- CSO and NPS Management
- WWTP Infrastructure & Maintenance

B. Ground Water

Subgoal - Ground water quality will meet all standards and ground water discharging to surface waters will not adversely impact the surface water system

Statewide Nitrate Loadings From Septic Systems

(Cause Indicator)



Ground Water Milestone & Focus Area: Establish an Ambient Ground Water Table Quality Monitoring Network by 2003

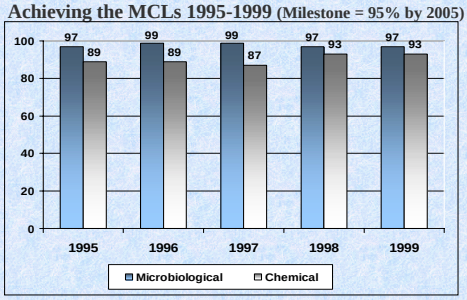
✔Environmental Status:

- Being set up over 5 years (1st year complete)
- Consists of 150 shallow randomly placed wells
- Monitors newly recharged ground water
- Focuses on non-point source pollution of ground water
- Is randomly stratified as a function of land use (urban, agricultural, undeveloped)

C. Drinking Water

Goal - Every person in New Jersey will have safe drinking water

Percent of Public Community Water Systems Achieving the MCLs 1995-1999 (Milestone = 95% by 2005)

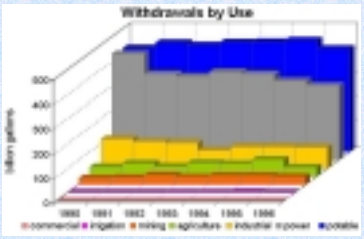


- Statewide private well quality data & indicators to be developed

D. Water Supply

Goal - Adequate quantities of surface and ground water will be available for needed use

✔Environmental Status



- Potable is largest category of water uses.

- Drinking water use - remained stable in 1990s.

Water Supply

Goal - Adequate quantities of surface and ground water will be available for all uses

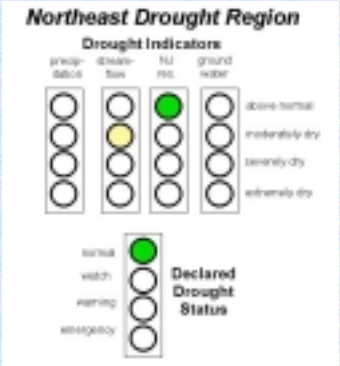
✔ Focus Areas for Water Quantity

- Develop flow goals that protect aquatic life
- Develop/ improve drought indicators.
- Install real-time monitoring of surface and ground water supplies
- Expand use of interconnections

Water Supply Goal - Adequate quantities for all uses.

✔Focus Area (Drought Network) Progress: Develop & implement drought indicators.

Drought declaration would rely on 4-part indicator that includes data on precipitation, stream flow, ground-water levels, and reservoir levels.



VI. Performance Measure Challenges and Water Examples

- Data quality - e.g., older surface water metals data
- Data availability - lack of statewide private well data
- Data representativeness - redesign of statewide ground & surface water quality networks
- Alignment between measures & goals (Fishable Goal - no one clear measure or index reflective of aquatic life & human consumption)

CHALLENGES (Cont.)

- **Standards/criteria revisions - effective incorporation into measures (additions & changes to drinking water standards)**
- **More complete evaluation of linkage between *cause* & *condition* indicators for adaptive management (point & nonpoint cause of aquatic life impairment)**
- **"Nesting" water indicators at different scales - national, different hydrologic units, watersheds, counties**

NATIONAL WATER PERFORMANCE MEASURE CHALLENGES

- **Maintain recent emphasis on environment in evaluating states' water performance**
- **Integrate state water performance measures with:**
  - Water Quality Inventory Reports (305b)
  - Impaired Waterbodies Lists (303d)
  - NEPPS Core Performance Measures
  - Consistent public communication messages

NATIONAL CHALLENGES (cont.)

- **Integrate at different spatial scales & among agencies**
  - National Index of Watershed Indicators (EPA)
  - National Ambient Water Quality Assessment (NAWQA - USGS)
- **Minimize unintended regulatory consequences of performance measures -TMDL requirements based on fish advisories indicators**

CONCLUSIONS

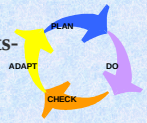
- **Performance measures - multi-media & complex**
- **Adequate resources needed for monitoring, assessment & information management**
- **Need system of measures to reflect environmental stresses, conditions & responses**
- **Performance measures system should be integrated into goal-based Environmental Results Management Planning System**

CONCLUSIONS - cont.

- **Performance measures system can effectuate meaningful changes in data collection & agency strategies**
- **Need to integrate state performance measures with national reporting**
- **Guard against misuse of measures for inappropriate decision-making & unintended regulatory consequences**

CONCLUSIONS - cont.

- **RBM system can be effective budget development tool**
- **RBM system can change public communication of environmental successes & challenges**
- **Environment should be focus of performance measures - guard against "activity measures creep" back into results-based management system**



ACKNOWLEDGEMENTS

- **Bryan Ianni - NJ NEPPS Co-chair**
- **Alena Baldwin-Brown - Executive Assistant**
- **Karen Schaffer - Water Assessment Team Lead**
- **All NEPPS Steering Committee members**